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Ornamental Hosts of the Reniform Nematode, *Rotylenchulus reniformis*[1]

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INTRODUCTION: The reniform nematode, *Rotylenchulus reniformis* Linford and Oliveira, causes economic losses to cotton (*Gossypium hirsutum* L.) (Fig.1), sweet potato (*Ipomea batata* L.), and vegetable crops in the continental United States (Clark and Wright 1983; Gazaway 1993; McSorley *et al.* 1981; Overstreet and McGawley 1994). Yield losses of 10% on vegetable crops, such as snap bean (*Phaseolus vulgaris* L.) and squash (*Cucurbita pepo* L.), and 7% on cotton have been assessed in southern Florida and Louisiana, respectively (McSorley *et al* 1981) (C. Overstreet, unpublished data). The geographical distribution of this nematode includes tropical and subtropical regions of North, Central and South America, Africa, and Asia (Ayala and Ramirez 1964). In the United States, the reniform nematode has been reported from southeastern states and also from Hawaii, where it is a serious pest of pineapple (*Ananas comosus* (L.) Merr.) (Heald and Robinson 1990). In Florida, field infestations of the reniform nematode are common in southern counties, especially in Broward and Dade, and also in the northwestern counties, from Jefferson to Santa Rosa (Heald and Robinson 1990). There are no reports of established field populations of *R. reniformis* in Arizona, California, and New Mexico. These states impose quarantine restrictions on plant and soil shipments containing this nematode to protect their crops from this pest. The ornamental industry of southern Florida is particularly adversely affected by these restrictions because the reniform nematode occurs commonly in the Rockdale and marl soils of southern Florida. The reniform nematode can contaminate and infect plant shipments, which are then rejected by Arizona, California and New Mexico. The purpose of this circular is to summarize published nematological information on the ornamental plants which support *R. reniformis* infection and reproduction.

Fig. 1. Yield losses induced by *Rotylenchulus reniformis* to cotton. A) Plant growth response to a contact nematicide in a Louisiana field infested by high population levels of the reniform nematode. Treated plants are on the left. B) Large patch of stunted plants in a Louisiana field infested by the reniform nematode.

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HOST RANGE AMONG ORNAMENTALS: The host range of the reniform nematode among vegetable and field crops is well known. Hundreds of plants including weeds have been reported as hosts of this nematode (Ayala and Ramirez 1964; Inserra *et al* 1989; Linford and Yap 1940). There is a lack of information on the host status of ornamentals to *R. reniformis*, mainly because of the great plant diversity existing in the ornamental industry and because of the frequent introduction of new plant species marketed as ornamentals. For sanitation and regulatory purposes it is important to know the host status of ornamentals to the reniform nematode. Ornamental hosts that maintain nematode populations in infested nurseries are sources of nematode contamination for non-host plants in nurseries and plant shipments. A list of ornamental hosts of the reniform nematode is reported in Table 1. Associations of *R. reniformis* with ornamentals were not included in this list, because such observations do not provide proof of host suitability.

Many of the ornamentals listed in Table 1 have not been tested with reniform nematode populations from Florida. Florida populations may not be able to reproduce on these plants since host preference variability occurs among reniform nematode isolates. However, the majority of weed hosts of the nematode reported in other countries of the world are infected by Florida populations of reniform nematodes (Inserra *et al* 1994). It is worthy to mention that ornamental species belonging to the same genus may have different host responses to the reniform nematode. For instance, in experiments conducted in Texas, *Ficus elastica* cv. *robusta* was a good host for this nematode, whereas *F. benjamina* L. and *F. lyrata* Werb. did not support nematode reproduction (Starr 1991).

In nurseries certified for states restricting the reniform nematode and with records of infestations by this pest, the ornamentals listed in Table 1 should be grown using clean stock, clean soil, and clean containers placed on benches not in contact with the ground. Under poor sanitary conditions these plants can become a source of nematode inoculum and contamination to non-host ornamentals.

Results of host tests conducted by the Division of Plant Industry using ornamental palms have shown that out of 19 palms and one cycad tested, only two palms, *Acoelorrhape wrightii* (Gurseb. & H. Wendle.) H. A. Wendl. ex Becc. and *Washingtonia robusta* H.A. Wendl. (Table 1) supported nematode infection and reproduction, suggesting that most ornamental palms are not hosts of *R. reniformis* (Inserra *et al* 1994). *Ravenea rivularis* Jumell and Perrier, *Trachycarpus fortunei* (Hook) H. Wendl., and *Wodyetia bifurcata* A.K. Irvine allowed nematode infection, but no reproduction of the parasite, indicating that long exposure of these palms to *R. reniformis* may favor the selection of nematode populations able to reproduce on these palms.

Table 1. Ornamental plants reported in the literature as suitable hosts of the reniform nematode (*Rotylenchulus reniformis*).

Scientific Name	Common Name	Geographical Population	Reference
Acoelorrhaphe (= *Paurotis*) *wrigthii* (Guiseb. & H. A. Wendl.) H. A. Wendl. ex Becc.	Everglades palm	Florida	Inserra *et al* 1994
Ananas comosus (L.) Merr.	pineapple	Hawaii	Linford and Yap 1940
Begonia semperflorens - cultorum Hort.	wax begonia	Hawaii	Linford and Yap 1940
Beloperone guttata Brandegee	shrimp plant	Hawaii	Linford and Yap 1940
Bixa orellana L.	annatto	Hawaii	Linford and Yap 1940
Buddleja asiatica Lour.	butterfly bush	Hawaii	Linford and Yap 1940

Calendula offcinalis L.	pot marigold	Hawaii	Linford and Yap 1940
Callistephus chinensis (L.) Nees.	China aster	Hawaii	Linford and Yap 1940
Carica papaya L.	papaya	Hawaii	Linford and Yap 1940
Chlorophytum comosum (Thunb.) Jacques `Variegatum'	spider plant	Texas	Starr 1991
Coccoloba uvifera L.	sea grape	Hawaii	Linford and Yap 1940
Coffea arabica (L.) L.	coffee	Africa	Vovlas and Lamberti 1990
Coleus scutellaroides (L.) Benth.	coleus	Hawaii	Linford and Yap 1940
Colocasia esulenta (L.) Schott	taro	Florida	McSorely *et al* 1983
Euphorbia pulcherrima Willd. ex Klotzsch	poinsettia	Hawaii	Linford and Yap 1940
Ficus elastica Roxb. ex Hornem. `Robusta'	rubber plant	Texas	Starr 1991
Hedychium coronarium J.G. Koenig	white ginger	Hawaii	Linford and Yap 1940
Impatiens balsamica L.	garden balsam	Hawaii	Linford and Yap 1940
Justicia brandegeana Wassh. & L.B. Sm.	shrimp plant	Hawaii	Linford and Yap 1940
Kalanchoe sp.	kalanchoe	Hawaii	Linford and Yap 1940
Musa acuminata Colla	banana	Sri Lanka	Vovlas and Ekanayake 1985
Nerium oleander (L.)	oleander	Florida	DPI record N95-00074
Nolina (= *Beaucarnea*) *recurvata* (Lem.) Hemsl.	elephant-foot tree	Texas	Starr 1991
Passiflora seemannii Griseb.	passion flower	Hawaii	Linford and Yap 1940
Philodendron bipinnatifidum (= *selloum*) Endl.	split-leaf philodendron	Texas	Starr 1991
Phlox drummondii Hook.	phlox	Hawaii	Linford and Yap 1940
Polyscias guilfoylei (Bull) L.H. Bailey	orolia	Hawaii	Linford and Yap 1940
Portulaca oleracea L.	purslane	Hawaii	Linford and Yap 1940
Radermachera sinica (Hance) Hemsl.	China doll	Texas	Starr 1991

Sansevieria trifasciata Hort. ex Prain	snake plant	Texas	Starr 1991
Schefflera actinophylla (Endl.) Harms	schefflera	Texas	Starr 1991
Schefflera arboricola (Hayata) Hayata	dwarf schefflera	Texas	Starr 1991
Schinus terebinthifolius Raddi	Brazilian pepper tree	Hawaii	Linford and Yap 1940
Tagetes erecta L.	African marigold	Hawaii	Linford and Yap 1940
Tagetes patula L.	French marigold	Hawaii	Linford and Yap 1940
Washingtonia robusta H. A. Wendl.	washingtonia palm	Florida	Inserra *et al* 1994
Xanthosoma spp.	elephant ear	Florida	McSorley *et al* 1983
Zinnia elegans Jacq.	zinnia	Hawaii	Linford and Yap 1940

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